

# Pengaruh Temperatur dan Jumlah Penambahan Reduktor Arang Cangkang Kelapa Sawit Terhadap Pembentukan Logam Besi Pada Hasil Reduksi Langsung Residu Proses Hidrometalurgi = Effect of Temperature and Amount of Addition of Palm Oil Charcoal Reductant on the Formation of Iron Metal in the Result of Direct Reduction of Residues from the Hydrometallurgical Process

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## Abstrak

Dengan cadangan nikel yang melimpah, industri pengolahan mineral di Indonesia akan semakin berkembang yang memungkinkan meningkatnya jumlah limbah pengolahan mineral yang dapat merusak lingkungan. Dibutuhkan metode-metode yang efektif untuk menanggulangi hal tersebut, salah satunya adalah mengolah kembali limbah tersebut untuk diambil logamnya seperti Fe. Penelitian ini bertujuan untuk menganalisis pengaruh temperatur dan kadar arang cangkang kelapa sawit terhadap fasa, struktur mikro dan pembentukan logam besi hasil reduksi langsung residu proses hidrometalurgi, Penelitian ini menggunakan metode reduksi langsung pada temperatur operasi 1000, 1100 dan 1200 selama 60 menit. Variasi temperatur operasi serta penambahan kadar arang cangkang kelapa sawit memberikan pengaruh terhadap hasil reduksi langsung yaitu meningkatnya derajat metalisasi dan derajat reduksi seiring dengan meningkatnya temperatur dan penambahan arang cangkang kelapa sawit. Derajat reduksi dan derajat metalisasi tertinggi berada pada variasi arang 30%, CaO 0% pada suhu 1200 sebesar 98.73% dan 98%.

.....With abundant nickel reserves, the mineral processing industry in Indonesia will continue to grow, which will allow an increase in the amount of mineral processing waste that can damage the environment. Effective methods are needed to overcome this, one of which is reprocessing the waste to extract metals such as Fe. This study aims to analyze the effect of temperature and charcoal content of oil palm shells on the phase, microstructure and formation of ferrous metal resulting from the direct reduction of residues from the hydrometallurgical process. This study used the direct reduction method at operating temperatures of 1000, 1100 and 1200 for 60 minutes. Variations in operating temperature and the addition of oil palm shell charcoal have an effect on the direct reduction results, namely increasing the degree of metallization and the degree of reduction along with the increase in temperature and the addition of oil palm shell charcoal. The highest degree of reduction and degree of metallization was at the variation of 30% charcoal, 0% CaO at 1200 temperature of 98.73% and 98%.